



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
CHEMICAL SAFETY AND  
POLLUTION PREVENTION

**MEMORANDUM:**

**To:** Jennifer Gaines

**From:** Tim Ciarlo, MS, Entomologist

**Secondary Review:** Jennifer Saunders, Ph.D., Senior Biologist

**Date:** August 15, 2017

**Subject:** PRODUCT PERFORMANCE DATA EVALUATION RECORD (DER)

~~THIS DER CONTAINS CONFIDENTIAL BUSINESS INFORMATION~~

**Note:** MRIDs found to be **unacceptable** to support label claims should be removed from the data matrix.

**DP barcode:** 439203

**Decision no.:** 527182

**Submission no:** 1000535

**Action code:** R260

**Product Name:** Anti-Mosquito Paint

**EPA File Symbol:** 46197-E

**Formulation Type:** Insecticide-impregnated paint

**Ingredients statement from the label with PC codes included:**

Permethrin 1.0% PC: 109701

**Application rate(s) of product and each active ingredient (lbs. or gallons/1000 square feet or per acre as appropriate; and g/m<sup>2</sup> or mg/cm<sup>2</sup> or mg/kg body weight as appropriate):** Apply 2 coats with brush or roller at an application rate of 1 gal Anti-Mosquito Paint per 250-300 ft<sup>2</sup> to achieve a dry film thickness (DFT) of 50-60 microns. Using the density range provided on the Basic CSF dated 3/24/2017, this rate delivers 47.3-53.0 g permethrin per gal per 250-300 ft<sup>2</sup> or 157.7-212.0 mg permethrin per ft<sup>2</sup>.

**Use Patterns:** Interior use to kill mosquitoes which land on painted surfaces, including non-porous interior ceilings, walls, doors, and trim. Not for use on floors or exterior surfaces.

**I. Action Requested:** Risk Manager has requested review of two newly submitted MRIDs to determine if residual efficacy claims against mosquitoes are supported.

**II. Background:** The proposed new product 46197-E is already registered in other countries. If registered, it will be the first such insecticidal paint registered in the US.

**III. MRID Summary (primary reviews are attached):**

**50192909. 2016. Panel application carried out for testing of efficacy and persistency of anti-mosquito paint (cement fiber board and wood), against three species of mosquitoes: *Aedes aegypti*, *Anopheles stephensi* and *Culex quinquefasciatus*.**

(1) non-GLP

(2) This MRID provides information on how the cement fiber board and wood panels used in the bioassays in MRID 50192910 were painted with the test substance and aged. The panels were painted with Anti-Mosquito Paint at an application rate of 1 liter per 68-72 ft<sup>2</sup>. When converted from liters to gallons, this application rate would deliver 1 gallon of Anti-Mosquito Paint to 257-273 ft<sup>2</sup>. Using the density range provided on the Basic CSF dated 3/24/2017, this rate delivers 47.3-53.0 g permethrin per gal per 257-273 ft<sup>2</sup> or 173.5-183.8 mg permethrin per ft<sup>2</sup>. In terms of permethrin applied per ft<sup>2</sup>, the labeled rate at 300 ft<sup>2</sup> is slightly lower than the lowest rate tested. Panels were aged at room temperature indoors for either 0 days (unaged), 3, 6, 12, 18, 24, or 30 months such that they were exposed to natural, diffused sunlight during daylight hours.

(3) **Conclusion: Supplemental.** Since no efficacy data are described in this MRID, it cannot support any efficacy claims as a standalone study. It does provide the information necessary to calculate the application rates used in the bioassays described in MRID 50192910.

**50192910. 2017. Efficacy and persistency of anti-mosquito painted panels (cement fiber board and wood), against three species of mosquitoes (*Aedes aegypti*, *Anopheles stephensi* and *Culex quinquefasciatus*).**

(1) GLP

(2) **Methods:** This study investigated the residual efficacy of Anti-Mosquito Paint (46197-E) against three species of mosquitoes (*Aedes aegypti*, *Anopheles stephensi*, and *Culex quinquefasciatus*). Cement fiber board panels and wood panels were painted with 46197-E at application rates of 183.3 and 173.5 mg permethrin per ft<sup>2</sup>, respectively, and aged for 0, 3, 6, 12, 18, 24, or 30 months. Panels were aged indoors at room temperature. Mosquitoes in untreated control replicates were exposed to untreated panels of one of the substrate types at each ageing interval.

Adult lab-reared 3-5 day-old female mosquitoes were used in efficacy trials. Each replicate consisted of ten mosquitoes of a single species confined to a treated panel with a Petri dish for 60 minutes. Panels were oriented vertically. Five replicates were included for each mosquito species at each of 7 ageing intervals for each substrate type. Additional replicates were treated in the same manner but with a shorter 30-minute exposure period. At the end of the exposure period, mosquitoes were transferred to clean containers. Mortality observations were made at 24, 48, 72, and 96 hours post-initial exposure. This experimental design was repeated with replicates that used WHO cones to confine mosquitoes instead of Petri dishes. The study investigators postulated that WHO cones might afford a lesser degree of confinement than the shallower Petri dishes, thereby creating a more conservative exposure scenario.

(3) **Results:** Mean mortality data for each of the 8 different scenarios are summarized in Figure 1 below. For the WHO cone bioassays, mean mortality was  $\geq 90\%$  for all three mosquito species for both substrate types for all ageing intervals up to 24 months. For the Petri dish bioassays, mean mortality was  $\geq 90\%$  for all three mosquito species for both substrate types for all ageing intervals up to 30 months, with the exception of the group exposed to wood panels for 30 minutes. In that exposure scenario, mean mortality was  $\geq 90\%$  for all three mosquito species for all ageing intervals up to 24 months. Untreated control mortality for each mosquito species across all exposure scenarios was  $\leq 10\%$  at all observation time points. Raw data were provided.

**Figure 1: Mean mortality of mosquitoes exposed for 30/60 minutes to cement fiber/wood panels aged 0/3/6/12/18/24/30 months.**

Panel: Cement Fiber Board  
Exposure Time: 30 Minutes  
Type of Exposure: Cone - vertical position

Time after exposure (hrs)	Mean mortality (%) - Aged panel																				
	0 month			3 month			6 month			12 months			18 month			24 month			30 months		
	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex
24	100	100	100	98	100	98	94	92	90	86	82	80	60	54	52	30	32	28	30	24	22
48	-	-	-	100	-	100	100	100	98	98	100	88	80	72	62	70	62	48	68	60	44
72	-	-	-	-	-	-	-	-	100	100	-	98	98	84	78	80	76	70	80	74	62
96	-	-	-	-	-	-	-	-	-	-	-	100	100	100	100	100	98	96	84	78	70
Control at 96 hr	4	8	10	10	6	10	8	10	6	10	8	6	8	6	8	10	10	8	8	10	10
LT <sub>100</sub> (Hours)	≤24	≤24	≤24	≤48	≤24	≤48	≤48	≤48	≤72	≤72	≤48	≤96	≤96	≤96	≤96	≤96	≤96	>96	>96	>96	>96

Mean of 5 replications; LT<sub>100</sub>: Time required to kill 100% of the tested mosquitoes

Panel: Cement Fiber Board  
Exposure Time: 60 Minutes  
Type of Exposure: Cone - vertical position

Time after exposure (hrs)	Mean mortality (%) - Aged panel																				
	0 month			3 month			6 month			12 months			18 month			24 month			30 months		
	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex
24	100	100	100	100	100	100	100	98	88	74	94	90	70	66	62	60	52	38	50	44	30
48	-	-	-	-	-	-	-	100	100	100	100	98	94	92	80	84	78	58	72	70	52
72	-	-	-	-	-	-	-	-	-	-	-	100	100	100	100	98	88	76	84	80	72
96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	100	94	90	88	78
Control at 96 hr	8	8	10	4	10	-	8	8	10	6	10	6	8	10	10	4	6	4	4	10	6
LT <sub>100</sub> (Hours)	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤48	≤48	≤48	≤48	≤72	≤72	≤72	≤72	≤96	>72	>96	>96	>96	>96

Mean of 5 replications; LT<sub>100</sub>: Time required to kill 100% of the tested mosquitoes

Panel: Cement Fiber Board  
Exposure Time: 30 Minutes  
Type of Exposure: Petridish - vertical position

Time after exposure (hrs)	Mean mortality (%) - Aged panel																				
	0 month			3 month			6 month			12 months			18 month			24 month			30 months		
	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex
24	100	100	100	100	100	100	100	100	100	98	96	92	96	94	92	94	72	72	56	60	54
48	-	-	-	-	-	-	-	-	-	100	100	100	100	100	100	100	86	78	88	80	72
72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	90	100	90	80
96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	100	94	90
Control at 96 hr	10	8	10	10	8	6	10	10	6	10	10	10	4	8	8	10	8	10	4	6	6
LT <sub>100</sub> (Hours)	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤48	≤48	≤48	≤48	≤48	≤48	≤48	≤48	≤72	≤72	≤72	>96

Mean of 5 replications; LT<sub>100</sub>: Time required to kill 100% of the tested mosquitoes

Panel: Cement Fiber Board  
Exposure Time: 60 Minutes  
Type of Exposure: Petridish - vertical position

Time after exposure (hrs)	Mean mortality (%) - Aged panel																				
	0 month			3 month			6 month			12 months			18 month			24 month			30 months		
	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex
24	100	100	100	100	100	100	100	100	100	100	100	100	98	100	94	98	90	86	70	78	64
48	-	-	-	-	-	-	-	-	-	-	-	-	100	-	100	100	100	94	94	84	70
72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	100	90	84
96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	98	96
Control at 96 hr	10	6	4	8	6	8	10	4	0	6	8	10	8	10	8	0	10	2	8	6	4
LT <sub>100</sub> (Hours)	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤48	≤24	≤48	≤48	≤48	≤96	≤72	>96	>96

Mean of 5 replications; LT<sub>100</sub>: Time required to kill 100% of the tested mosquitoes

Panel: Wood  
Exposure Time: 30 Minutes  
Type of Exposure: Cone - vertical position

Mean mortality (%) - Aged panel																					
Time after exposure (hrs)	0 month			3 month			6 month			12 months			18 month			24 month			30 months		
	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex
24	100	100	100	70	86	66	84	80	74	70	74	66	52	46	40	24	28	24	20	18	14
48	-	-	-	100	100	100	98	96	90	86	90	80	66	60	56	60	50	40	52	48	36
72	-	-	-	-	-	-	100	100	100	100	100	94	84	72	68	74	66	58	76	70	58
96	-	-	-	-	-	-	-	-	-	-	-	100	100	100	100	100	100	100	80	72	64
Control at 96 hr.	10	8	3	8	10	8	8	10	6	10	10	8	10	8	8	10	2	6	8	6	10
LT <sub>100</sub> (Hours)	≤24	≤24	≤24	≤48	≤48	≤48	≤72	≤72	≤72	≤72	≤72	≤96	≤96	≤96	≤96	≤96	≤96	≤96	>96	>96	>96

Mean of 5 replications; LT<sub>100</sub>: Time required to kill 100% of the tested mosquitoes

Panel: Wood  
Exposure Time: 60 Minutes  
Type of Exposure: Cone - vertical position

Time after exposure (hrs)		Mean mortality (%) - Aged panel																				
		0 month			3 month			6 month			12 months			18 month			24 month			30 months		
		Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex
24	100	100	100	100	100	100	94	90	80	72	86	78	62	60	54	52	48	42	34	36	26	
48	-	-	-	-	-	-	100	100	100	100	100	100	80	82	74	74	68	48	66	64	46	
72	-	-	-	-	-	-	-	-	-	-	-	-	100	100	100	86	78	68	78	70	66	
96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	100	100	86	86	72	
Control at 96 hr	10	10	8	10	8	10	8	10	8	10	10	8	10	10	10	8	2	6	8	10	8	
LT <sub>100</sub> (Hours)	≤24	≤24	≤24	≤24	≤24	≤24	≤48	≤48	≤48	≤48	≤48	≤48	≤72	≤72	≤72	≤96	≤96	≤96	>96	>96	>96	

Mean of 5 replications; LT<sub>100</sub>: Time required to kill 100% of the tested mosquitoes

Panel: Wood  
Exposure Time: 30 Minutes  
Type of Exposure: Petridish - vertical position

Time after exposure (hrs)		Mean mortality (%) - Aged panel																				
		0 month			3 month			6 month			12 months			18 month			24 month			30 months		
		Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex
24	100	100	100	100	100	100	100	100	100	90	86	84	80	78	74	84	80	78	50	52	46	
48	-	-	-	-	-	-	-	-	-	100	100	100	100	100	100	100	100	90	72	70	54	
72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	90	80	78	
96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	88	80	
Control at 96 hr	10	10	4	8	10	6	4	10	8	6	6	10	10	10	10	10	6	8	6	10	8	
LT <sub>100</sub> (Hours)	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤48	≤48	≤48	≤48	≤48	≤48	≤48	≤48	≤72	≤96	>96	>96	

Mean of 5 replications; LT<sub>100</sub>: Time required to kill 100% of the tested mosquitoes

Panel: Wood  
Exposure Time: 60 Minutes  
Type of Exposure: Petridish - vertical position

Time after exposure (hrs)		Mean mortality (%) - Aged panel																				
		0 month			3 month			6 month			12 months			18 month			24 month			30 months		
		Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex	Aedes	Anopheles	Culex
24	100	100	100	100	100	100	100	100	100	100	100	100	100	100	90	92	68	66	68	60	60	
48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	100	100	78	90	80	72	
72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	82	96	92	84	
96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	100	100	90	
Control at 96 hr	10	8	10	2	10	8	8	8	10	10	4	6	4	6	8	10	10	10	2	6	4	
LT <sub>100</sub> (Hours)	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤24	≤48	≤48	≤48	≤96	≤96	≤96	>96	

Mean of 5 replications; LT<sub>100</sub>: Time required to kill 100% of the tested mosquitoes

(4) **Conclusion: Acceptable.** MRID 50192910 supports that Anti-Mosquito Paint kills/controls *Ae. aegypti*, *An. stephensi*, and *Cx. quinquefasciatus* mosquitoes for up to 24 months/2 years when applied indoors at a rate of 173.5 mg permethrin per ft<sup>2</sup>, or 1 gallon of Anti-Mosquito Paint per 273 ft<sup>2</sup>.

#### **IV. EXECUTIVE DATA SUMMARY:**

(A) MRID 50192910, together with MRID 50192909, supports that Anti-Mosquito Paint kills/controls mosquitoes for up to 24 months/2 years when applied indoors at a rate of 173.5 mg permethrin per ft<sup>2</sup>, or 1 gallon of Anti-Mosquito Paint per 273 ft<sup>2</sup>.

#### **V. LABEL RECOMMENDATIONS:**

(1) The following changes in the Directions for Use are suggested:

In the “Coverage and thickness” section on page 3 of 5 of the product label, the upper end of the square footage range should be changed from 300 ft<sup>2</sup> to 273 ft<sup>2</sup> to align with the lowest rate applied to the panels used in efficacy trials.

(2) The following marketing claims are acceptable:

Anti- Mosquito Paint is a premium quality acrylic emulsion paint for interior use to kill mosquitoes which land on painted surfaces

Will continue killing mosquitoes for up to 2 years

Will kill the mosquito species which can carry Zika virus, chikungunya virus, and West Nile virus

(3) The following marketing claims are unacceptable:

Will kill the mosquito species which can carry malaria (malaria does not occur in the US)

(4) The following MRIDs should be removed from the data matrix, as they are classified as “unacceptable” to support the product:

N/A

(5) Note to reviewer/PM:

The two substrate types included in the efficacy trials reviewed here were both porous surfaces (cement fiber board and wood). However, the product label specifies that the product should be applied to non-porous surfaces. Typically, efficacy is more difficult to achieve on porous surfaces vs non-porous surfaces because the pesticide may be absorbed by the substrate and become unavailable to mosquitoes which might land on it. Therefore, although we typically request data on both porous and non-porous surfaces for a general residual claim, it is reasonable to expect the product will work as well on non-porous surfaces as it would on the tested porous surfaces. It is recommended that the PM discuss the discrepancy between the tested porous surface and the labeled non-porous surface with the registrant.

## TASK 2 DATA EVALUATION RECORD

**STUDY TYPE: Product Performance**

**MRID 50192909. Panel Application Carried Out for Testing of Efficacy and Persistency of Anti-Mosquito Paint (Cement Fiber Board and Wood), against Three Species of Mosquitoes: *Aedes aegypti*, *Anopheles stephensi*, and *Culex quinquefasciatus*, V. Kumar and H. Mewada, 2016.**

**OCSPP Product Performance Guideline: 810.3500**

**Product Name: Anti-Mosquito Paint  
EPA Reg. No. or File Symbol: 46197-E  
Decision number: 527182  
DP number: Not Provided**

Prepared for  
Registration Division (7505)  
Office of Pesticide Programs  
U.S. Environmental Protection Agency  
Washington, DC 20460

Prepared by  
Summitec Corporation  
Task Order No.: Efficacy-03

Primary Reviewer:  
Chris Peterson, Ph.D.

Signature: Chris Peterson <sup>AE</sup>  
Date: 07/03/2017

Secondary Reviewers:  
Gene Burgess, Ph.D.

Signature: Gene Burgess <sup>AE</sup>  
Date: 07/03/2017

Robert H. Ross, M.S. Project Manager

Signature: Robert H. Ross <sup>AE</sup>  
Date: 07/03/2017

Quality Assurance:  
Angela M. Edmonds, B.S.

Signature: Angela M. Edmonds  
Date: 07/03/2017

### Disclaimer

This review may have been altered subsequent to the contractors' signatures above.  
Summitec Corp. for the U.S. Environmental Protection Agency under Contract No. EP-W-16-019

**EFFICACY STUDY DATA EVALUATION RECORD (COMPLETED STUDY) -  
Registration**

**Primary Reviewer's Name/Title:** Chris Peterson, Toxicologist

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<b>STUDY TYPE:</b>	PRODUCT PERFORMANCE [810.3500]
<b>MRID:</b>	50192909. Panel Application Carried Out for Testing of Efficacy and Persistency of Anti-Mosquito Paint (Cement Fiber Board and Wood), against Three Species of Mosquitoes: <i>Aedes aegypti</i> , <i>Anopheles stephensi</i> , and <i>Culex quinquefasciatus</i> , V. Kumar and H. Mewada, 2016.
<b>DP BARCODE NO:</b>	Not provided
<b>DECISION NO:</b>	527182
<b>CONFIDENTIALITY CLAIMS:</b>	None
<b>GOOD LABORATORY PRACTICE:</b>	<p>This study was conducted to support a concurrently-submitted GLP study, which reports the results of a series of bioassays. This study documents the treatment and storage of the test samples used in these bioassays. At the time that this study was initiated, the testing facility was not aware that compliance with Good Laboratory Practice (as defined by 40 CFR part 160) would be needed, therefore this study was not conducted in full compliance with Good Laboratory Practice.</p> <p>The following is a list of the known items which this study lacked and thus did not fully comply with 40 CFR part 160.</p> <ol style="list-style-type: none"><li>1. Formal quality assurance observations records, including a master schedule (40 CFR part 160.35)</li><li>2. SOPs for maintenance, calibration and cleaning of equipment used or records of such activities (40 CFR part 160.63 (b) &amp; (c) respectively)</li><li>3. SOPs for procedures used in study (40 CFR part 160.81)</li><li>4. Chain of custody letter linking transport, storage and use of test substance at site of treatment with site of subsequent testing.</li><li>5. Signed protocol used for conduct of study (40 CFR parts 160.120 &amp; 160.130)</li></ol>

6. Records of staff training, and equipment maintenance, calibration and cleaning (40 CFR part 160.195 (e) & (f) respectively)

**SUBJECT PRODUCT:**

PRODUCT NAME: Anti-Mosquito Paint

EPA FILE SYMBOL: 46197-E

FORMULATION TYPE: Paint

ACTIVE INGREDIENT NAME: Permethrin 1.00%; PC  
CODE: 109701

PRODUCT APPLICATION RATE(S) AS LABELED  
AND AS APPLICABLE TO THIS MRID: 250 to 300  
square feet/gallon

ACTIVE INGREDIENT APPLICATION RATE(S): 126.2  
to 151.4 mg/square foot permethrin

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## **Efficacy Study Data Evaluation Record**

### **Purpose of study**

This study was conducted to determine the efficacy and residual activity of cement fiber boards and wood panels painted with Kansai Paint's Anti-Mosquito Paint containing 1% permethrin.

### **Materials and Methods**

Two coats of Kansai Anti-Mosquito Paint containing 1% permethrin were applied to 25 × 25 cm cement fiber board or wooden panels by using a brush or roller, which covered 68 to 72 square feet/liter for two coats, corresponding to an a.i. rate of 138.9 to 147.1 mg/square foot permethrin if a density of 1 g/ml is assumed. This method of application and a.i. rate correspond to that on the label. In total, 36 panels were treated at irregular intervals over the course of 22 months; the purpose of this was not described.

This study does not report any bioassay methods, and no testing results are reported. Relevant testing methods and results are presented in MRID 50192910.

### **Results**

This study reports only the application of the Anti-Mosquito Paint to the cement fiber board or wooden panels. No bioassays are described or reported. Relevant testing methods and results are presented in MRID 50192910.

## **Conclusions**

Kansai Anti-Mosquito Paint was applied in a manner and at an a.i. rate consistent with the label, but no bioassay methods are described and no bioassay results are presented. Relevant testing methods and results are presented in MRID 50192910.

## TASK 2 DATA EVALUATION RECORD

**STUDY TYPE: Product Performance**

**MRID 50192910. Panel Application Carried Out for Testing of Efficacy and Persistency of Anti-Mosquito Painted Panels (Cement Fiber Board and Wood), against Three Species of Mosquitoes: *Aedes aegypti*, *Anopheles stephensi*, and *Culex quinquefasciatus*, R. Shanmugasundaram, 2017.**

**OCSP Product Performance Guideline: 810.3500**

**Product Name: Anti-Mosquito Paint  
EPA Reg. No. or File Symbol: 46197-E  
Decision number: 527182  
DP number: Not Provided**

Prepared for  
Registration Division (7505)  
Office of Pesticide Programs  
U.S. Environmental Protection Agency  
Washington, DC 20460

Prepared by  
Summitec Corporation  
Task Order No.: Efficacy-03

Primary Reviewer:  
Chris Peterson, Ph.D.

Signature: Chris Peterson <sup>NE</sup>  
Date: 07/03/2017

Secondary Reviewers:  
Gene Burgess, Ph.D.

Signature: Gene Burgess <sup>NE</sup>  
Date: 07/03/2017

Robert H. Ross, M.S. Project Manager

Signature: Robert H. Ross <sup>NE</sup>  
Date: 07/03/2017

Quality Assurance:  
Angela M. Edmonds, B.S.

Signature: Angela M. Edmonds  
Date: 07/03/2017

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Summitec Corp. for the U.S. Environmental Protection Agency under Contract No. EP-W-16-019

**EFFICACY STUDY DATA EVALUATION RECORD (COMPLETED STUDY) -  
Registration**

**Primary Reviewer's Name/Title:** Chris Peterson, Toxicologist

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<b>STUDY TYPE:</b>	PRODUCT PERFORMANCE [810.3500]
<b>MRID:</b>	50192910. Panel Application Carried Out for Testing of Efficacy and Persistency of Anti-Mosquito Painted Panels (Cement Fiber Board and Wood), against Three Species of Mosquitoes: <i>Aedes aegypti</i> , <i>Anopheles stephensi</i> , and <i>Culex quinquefasciatus</i> , R. Shanmugasundaram, 2017.
<b>DP BARCODE NO:</b>	Not provided
<b>DECISION NO:</b>	527182
<b>CONFIDENTIALITY CLAIMS:</b>	None
<b>GOOD LABORATORY PRACTICE:</b>	<p>The study was conducted in compliance with the following standards:</p> <ol style="list-style-type: none"><li>1. ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories under the Certificate Number: T – 2447 (valid till 23<sup>rd</sup> September 2017)</li><li>2. NABL 102 Specific Criteria for Biological Testing Laboratories.</li><li>3. Good Laboratory Practice standards as defined by the U. S. Environmental Protection Agency (EPA-FIFRA) Title 40 of the US Code of Federal Regulations Part 160, 16 October 1989.</li></ol> <p>Exceptions: Test material characterization (identity, active of the paint and age of the panels) method of application, dosage and location of documents for the application are the responsibility of the sponsor.</p> <p>Test materials were not checked for ingredients and stability. The results are reported as per the label of the material provided by sponsor.</p>
<b>SUBJECT PRODUCT:</b>	<p>PRODUCT NAME: Anti-Mosquito Paint</p> <p>EPA FILE SYMBOL: 46197-E</p> <p>FORMULATION TYPE: Paint</p>

ACTIVE INGREDIENT NAME: Permethrin 1.00%; PC

CODE: 109701

PRODUCT APPLICATION RATE(S) AS LABELED  
AND AS APPLICABLE TO THIS MRID: 250 to 300  
square feet/gallon

ACTIVE INGREDIENT APPLICATION RATE(S): 126.2  
to 151.4 mg/square foot permethrin

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## **Efficacy Study Data Evaluation Record**

### **Purpose of study**

This study was conducted to determine the efficacy and persistency for up to 30 months of cement fiber board and wooden panels treated with Kansai Anti-Mosquito Paint containing 1% permethrin to three species of mosquitoes.

### **Materials and Methods**

Application methods of the Kansai Anti-Mosquito Paint to cement fiber board and wooden panels are described in MRID 50192909.

Mosquito bioassays were conducted in Bhosari, Pune, India on species of relevance in the United States by using appropriate testing methods. All bioassays used 3- to 5-day old adult female insecticide-susceptible mosquitoes (yellow fever mosquitoes, *Aedes aegypti*; malaria mosquitoes, *Anopheles stephensi*; and house mosquitoes, *Culex quinquefasciatus*) bred in laboratory at Ross Lifesciences. The tests were conducted by securing WHO cones or plastic petri dishes to cement fiber board or wooden panels painted as described in MRID 50192909 that had been aged for 0, 3, 6, 12, 18, 24 and 30 months. [Note: In MRID 50192909, the panels are described as being painted at irregular intervals over the course of 22 months and stored. It is not clear how these panels correspond to the panels used in the present study.] Untreated panels consisted of untreated cement fiber board and wood panels, but it is not reported if the untreated panels were painted or bare. Five replicates of 10 mosquitoes of the respective species were exposed separately to the treated surfaces for 30 and 60 minutes before being removed to clean surfaces, after which they were observed for mortality (criteria not defined, notation of morbidity and mortality not described) daily for 24 to 96 hours at  $28 \pm 2^{\circ}\text{C}$  and 50 to 80% RH. It is not clear if separate panels were used for the different aging periods or if the same panels were used, in which case a repeated-measures analysis would need to be performed. The data were not statistically analyzed.

## Results

Treatment of cement fiber board or wooden panels with Kansai Anti-Mosquito Paint containing 1% permethrin at a.i. rates of 138.9 to 147.1 mg/square foot permethrin (see MRID 50192909; assumes a density of 1 g/ml) caused  $\geq 90\%$  mortality following 30- and 60-minute exposure in cone and petri dish assays to all three mosquito species tested on panels aged for 24 to 30 months, as indicated in Table 1.

**Table 1. Greatest number of months after application painted panels caused  $\geq 90\%$  mortality following 30- or 60-minute exposure to the three mosquito species tested in WHO cone and petri dish assays.**

**Table 1. Duration of aging of painted panels and 90% mortality among mosquitoes**

PANEL TYPE	TEST	LONGEST AGING PERIOD (MONTHS) FOR $\geq 90\%$ MORTALITY		
		<i>Aedes aegypti</i>	<i>Anopheles stephensi</i>	<i>Culex. quinquefasciatus</i>
CEMENT FIBER BOARD	CONE 30 min.	24	24	24
	CONE 60 min.	30	24	24
	PETRI 30 min.	30	30	30
	PETRI 60 min	30	30	30
WOOD	CONE 30 min.	24	24	24
	CONE 60 min.	24	24	24
	PETRI 30 min.	30	24	24
	PETRI 60 min	30	30	30

Control mortality did not surpass 10% during the test, although 10% mortality was observed in several instances. The author does not report any deviations or amendments from the protocol.

## Conclusions

Treatment of cement fiber board or wooden panels with Kansai Anti-Mosquito Paint containing 1% permethrin at a.i. rates of 138.9 to 147.1 mg/square foot permethrin (see MRID 50192909) caused  $\geq 90\%$  mortality following 30- and 60-minute exposure in cone and petri dish assays to all three mosquito species tested on panels aged for up to 24 and 30 months after treatment.